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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,044	03/19/2004	Hee Tae Jung	4240-104	9621

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INTELLECTUAL PROPERTY / TECHNOLOGY LAW
PO BOX 14329
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EXAMINER	
GROSS, CHRISTOPHER M	

ART UNIT	PAPER NUMBER
1639	

MAIL DATE	DELIVERY MODE
03/17/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/805,044	JUNG ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER M. GROSS	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-29* is/are pending in the application.

4a) Of the above claim(s) *1-5,12,14-21,27 and 29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-11,13,22-26,28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Responsive to communications entered 12/17/2009. Claims 1-5, 7-29 are pending. Claims 1-5, 12,14-21, 27 and 29 are withdrawn. Claims 7-11,13,22-26,28 are examined herein.

Priority

The present application has a US filing date of 3/19/2004. Acknowledgment is again made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d) to Korean patents 10-2003-0051140 filed 07/24/2003 and 10-2003-0051826 filed 07/26/2003.

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Maintained Claim Rejection - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Jung et al** (US Patent Application 2004/0142285 – IDS entry 3/27/2009).

The claimed subject matter per claim 7 is drawn to a high density carbon nanotube (CNT) film or pattern consisting of:

laminated CNT layers, wherein the layers are bound together by reaction of a carboxyl group and an amine group and wherein a top layer has exposed carboxyl groups on the surface thereof, and wherein the CNT film or pattern is prepared by a method comprising the steps of:

(a) reacting a substrate having amine groups exposed on the surface or a substrate having amine groups exposed in a pattern with CNT having exposed carboxyl groups to form a CNT single layer or single layer pattern on the surface of the substrate by amidation reaction between the amine groups and the carboxyl groups;

(b) reacting the CNT single layer or single layer pattern with an organic diamine to modify the CNT single layer with organic amine groups and reacting the organic amine groups with the CNT having exposed carboxyl groups to laminate a CNT layer thereon, wherein the CNT layer is laminated directly on the CNT single layer or single layer pattern by reaction of the amine groups and the carboxyl ; and

(c) repeating step (b) to form laminated CNT layers, thereby forming a high density CNT film or pattern having exposed carboxyl groups.

For ***claim 7-***, Jung et al teach throughout the document and especially the abstract and paragraphs 0010-0019 preparation of a multilayer CNT film/pattern

in which carboxylated CNTs are laminated together with organic diamines to form bis amide crosslinks. Starting with a surface substrate such as aminated glass, Jung et al prepare said film/pattern with a layer-by-layer approach, (alternating CNT and diamine) ending with a carboxylated CNT, thus providing a top layer has exposed carboxyl groups, and therein the product of Jung et al meet all of the structural limitations of the claimed product EVEN INCLUDING the product-by-process limitations (i.e., steps a-c) and thus would either anticipate or render obvious the claimed composition.

It should be noted, MPEP § 2113 states, "'[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.' *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)." Here, Applicants' claims are drawn to a CNT film (i.e., a product), but are defined by various method steps that produce said film and, as a result, represents a product-by-process claim. As a result, the process limitations do not appear to provide any patentable weight to the claimed invention in accordance with MPEP § 2113. One of ordinary skill would expect the product to be the same no matter how it was synthesized and/or prepared.

Response to Arguments

On p 2-4 of the remarks entered 12/17/2009, applicant argues the present application claims benefit of foreign priority to Korean patents:10-2003-0051140 (referred to as '140) filed 07/24/2003 and 10-2003-0051826 (referred to as '826) filed 07/26/2003, antedating Jung et al as a reference. Applicant urges that while translations have not been provided, because figures 1A-C,2,3 of '140 and 1-2 of '826 provide support for independent claims 7 and 22, a translation is not necessary per 37 CFR 1.55(4)(i)(B).

Applicant's arguments have been fully considered but they are not deemed persuasive for the following reasons.

First, in accordance with MPEP 201.14(b) III, last paragraph and MPEP 706.02(b)(E) a "regular national filing" gives rise to the right of priority, the mere submission of **a certified copy of the earlier filed foreign application, however, may <u>not</u> be sufficient** to perfect that right in this country. For example, among other things, an application **filed in a foreign country must contain a disclosure of the invention adequate to satisfy the requirements of 35 U.S.C. 112**, in order to form the basis for the right of priority in a later filed United States application. Emphasis added.

The filing date of the priority document is not perfected unless applicant has filed a certified priority document in the application (and an English language translation, if the document is not in English) (see 37 CFR 1.55(a)(3)) and the examiner has established that the priority document satisfies the enablement and description requirements of 35 U.S.C. 112, first paragraph. Emphasis added.

Here, since '140 and '826 are both written in Korean and not English, it is not possible to appropriately assess compliance with 35 USC 112 first paragraph.

Second, in regard '140 '140, the examiner notes that figures 1A-C do not exist. Similarly, with regard to '826 figures 1-2 do not show a thiol group, etc, as applicant alleges in the table from on pp 3-4 of the remarks.

Maintained Claim Rejection - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7 and 8-11,13,22-26,28 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Niu et al** (US Patent 6,872,681; of record) in view of **Jung et al** (US Patent Application 2004/0142285 – IDS entry 3/27/2009).

Niu et al teach, throughout the document and especially the abstract and column 10, line 61 compositions comprising oxidized nanotubes with carboxylic acid groups such as is set forth in claims 7a-b and 22a-b .

Niu et al teach under 'Secondary Functionalization of Oxidized Nanotubes," bridging columns 10 and 11, the immobilization of proteins (elected species of claim 11) thereto said CNTs , enzymes, oligonucleotides, etc, which is taken as the bio-receptor set forth in claim 8.

The proteins of Niu et al, absent evidence to the contrary, have amine groups capable of forming an amide bond with the carboxyl groups on the CNT mentioned above, reading on claims 9-11, 22d, 23, 25, 26 (elected species).

Niu et al teach in the table in column 11, dimines such as "H_2N-R_1-NH_2" wherein R_1 is C_1-C_{20} saturated hydrocarbon (elected species) as set forth in claim 24 as well as aldehydes, hydroxyls, thiols and halogens as set forth in claims 22d and 23 for modifying the CNTs.

Niu et al do not teach the carboxylated CNT/diamine multilayer form or pattern made in the manner set forth in claims 7c and 22c.

Jung et al teach throughout the document and especially the abstract and paragraphs 0010-0019 preparation of a multilayer CNT film/pattern in which carboxylated CNTs are laminated together with organic diamines to form bis amide crosslinks. Starting with a surface substrate such as aminated glass, Jung et al prepare said film/pattern with a layer-by-layer approach, (alternating carboxylated CNT and diamine) ending with a carboxylated CNT, as set forth in claims 7c and 22c.

It would have been *prima facie* obvious for one of ordinary skill in the art, at the time the claimed invention was made to use the process of generating carboxylated CNT-diamine multilayer laminates per Jung et al and cap the top with a protein in the manner of Niu et al.

One of ordinary skill in the art would have been motivated to use the process of generating carboxylated CNT-diamine multilayer laminates per Jung et al and cap the

top with a protein in the manner of Niu et al because it would provide for greater surface density, advantageous according to Jung et al in paragraph 0005.

With regard to claims 13 and 28, a recitation of the intended use of the CNT biochip set forth in claim 10 (from which claim 13 depends) and claim 25 (from which claim 28 depends) must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

One of ordinary skill could use the lamination process of Jung et al in concert with the protein, etc. derivatized nanotubes of Niu et al because both references use very similar chemistry (i.e. carboxylated nanotubes reacted with diamines to form bis amides) and therein, the nanotubes of Niu et al falls well within the scope of technology according to Jung et al.

Accordingly, the claimed invention was within the ordinary skill in the art to make and use at the time the claimed invention was made and was as a whole, *prima facie* obvious.

Response to Arguments

On p 4-5 of the remarks entered 12/17/2009, applicant again argues the present application claims benefit of foreign priority to Korean patents:10-2003-0051140 (referred to as '140) filed 07/24/2003 and 10-2003-0051826 (referred to as '826) filed 07/26/2003 antedating Jung et al as a reference. Applicant urges that while translations

have *not* been provided, because figures 1A-C,2,3 of '140 and 1-2 of '826 provide support for independent claims 7 and 22, a translation is not necessary per 37 CFR 1.55(4)(i)(B).

Applicant's arguments have been fully considered but they are not deemed persuasive for the following reasons.

First, in accordance with MPEP 201.14(b) III, last paragraph and MPEP 706.02(b)(E) a "regular national filing" gives rise to the right of priority, the mere submission of **a certified copy of the earlier filed foreign application, however, may <u>not</u> be sufficient** to perfect that right in this country. For example, among other things, an application **filed in a foreign country must contain a disclosure of the invention adequate to satisfy the requirements of 35 U.S.C. 112**, in order to form the basis for the right of priority in a later filed United States application. Emphasis added.

Perfecting a claim to priority under 35 U.S.C. 119(a)-(d) within the time period set in 37 CFR 1.55(a)(1) or filing a grantable petition under 37 CFR 1.55(c). See MPEP § 201.13. The foreign priority filing date must antedate the reference and be perfected. **The filing date of the priority document is not perfected unless applicant has filed a certified priority document in the application (and an English language translation, if the document is not in English)** (see 37 CFR 1.55(a)(3)) and the examiner has established that the priority document satisfies the enablement and description requirements of 35 U.S.C. 112, first paragraph. Emphasis added.

Here, since '140 and '826 are both written in Korean and not English, it is not possible to appropriately assess compliance with 35 USC 112 first paragraph, especially with regard to the present dependent claims.

Second, in regard '140, the examiner notes that figures 1A-C do not exist. Similarly, with regard to '826 figures 1-2 do not show a thiol group, etc, as applicant alleges in the table from on pp 3-4 of the remarks.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER M. GROSS whose telephone number is (571)272-4446. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on 571 272 0951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Christopher M Gross
Examiner
Art Unit 1639

cg

/ Christopher S. F. Low /
Supervisory Patent Examiner, Art Unit 1639